What is Claimed is:

1. A Process for preparing levosalbutamol or the pharmacologically acceptable salts thereof comprising starting from prochiral salbutamone as educt, subjecting that salbutamone to asymmetric hydrogenation in the presence of rhodium and a chiral bidentate phosphine ligand as catalyst system, and optionally converting the levosalbutamol into a salt with an acid.

2. The Process according to claim 1, wherein the ligand is (2R, 4R)-4-(dicyclohexylphosphino)-2-(diphenylphosphino-methyl)-N-methyl-aminocarbonyl-pyrrolidine.

3. The Process according to claim 1, wherein the ligand is polymer-bound (2R, 4R)-4-(dicyclohexylphosphino)-2-(diphenylphosphino-methyl)-N-methyl-aminocarbonyl-pyrrolidine.

4. The Process according to claim 1 wherein the asymmetric hydrogenation is carried out in a temperature range from 20°C to 100°C.

5. The Process according to claim 4, wherein the asymmetric hydrogenation is carried out in a temperature range from 40°C to 60°C.

6. The Process according to claim 5, wherein the asymmetric hydrogenation is carried out in a temperature range from 45°C to 55°C.

7. The Process according to claim 1 wherein the asymmetric hydrogenation is carried out under a pressure of more than 1 bar to 100 bar.

8. The Process according to claim 7, wherein the asymmetric hydrogenation is carried out under a pressure of about 20 bar.

9. The Process according to claim 1 wherein the asymmetric hydrogenation is carried out in a protic solvent.

10. The Process according to claim 9, wherein the asymmetric hydrogenation is carried out in a branched or unbranched $C_1 - C_8$-alkanol as solvent.

11. The Process according to claim 10, wherein the asymmetric hydrogenation is carried out in methanol, ethanol, n-propanol and/or isopropanol as solvent.

12. The Process according to claim 11, wherein the solvent for the asymmetric hydrogenation contains water.

13. The Process according to claim 1 wherein during asymmetric hydrogenation salbutamone is used in a molar ratio to the rhodium catalyst of from 500:1 to 100000:1.

14. The Process according to claim 13, wherein the molar ratio of salbutamone to the rhodium catalyst during asymmetric hydrogenation is about 1000:1.

15. The Process according to claim 1 wherein the rhodium catalyst for the asymmetric hydrogenation is used as a pre-prepared solution.

16. The Process according to claim 15 wherein the rhodium catalyst for the asymmetric hydrogenation is produced *in situ*.

17. The Process according to claim 1 wherein the asymmetric hydrogenation is carried out within a reaction time of 2 to 48 hours.

18. The Process according to claim 17, wherein the reaction time for the asymmetric hydrogenation is about 23 hours.

19. The Process according to claim 1 wherein the salbutamone is prepared starting from N-benzylsalbutamone by hydrogenation in the presence of a palladium catalyst.

20. The Process according to claim 1 wherein:

the asymmetric hydrogenation is carried out under a pressure of 10 bar to 50 bar;

the salbutamone is used in a molar ratio to the rhodium catalyst of from 750:1 to 20000:1; and

the reaction time is 4 to 36 hours.

21. A Process for preparing levosalbutamol or the pharmacologically acceptable salts thereof, comprising :

(a) brominating 4-acetyloxy-3-acetyloxymethylbenzophenone,

(b) reacting the product obtained with N-*tert*-butyl-N-benzylamine,

(c) hydrogenating the N-benzylsalbutamone obtained in the presence of a palladium catalyst,

(d) hydrogenating the salbutamone obtained in the presence of rhodium and a chiral bidentate phosphine ligand, and

(e) optionally treating it with an acid.